PATENT COOPERATION TREATY

From the:
INTERNATIONAL SEARCHING AUTHORITY

To:

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PCT

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY 22nd.

(PCT Rule 43*bis*.1) 17 AUG 05
FINAL DATE 17 JAN 06

Date of mailing *(day/month/year)*	06 JAN 2005
Applicant's or agent's file reference 54923PCT	FOR FURTHER ACTION See paragraph 2 below

International application No.	International filing date *(day/month/year)*	Priority date *(day/month/year)*
PCT/AU2004/001415	15 October 2004	17 October 2003

International Patent Classification (IPC) or both national classification and IPC
Int. Cl. [7] H05B 41/16, H02M 3/22

Applicant
VICIOUS POWER PTY LTD et al

1. This opinion contains indications relating to the following items:

- [X] Box No. I — Basis of the opinion
- [ ] Box No. II — Priority
- [ ] Box No. III — Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- [ ] Box No. IV — Lack of unity of invention
- [X] Box No. V — Reasoned statement under Rule 43*bis*.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- [ ] Box No. VI — Certain documents cited
- [ ] Box No. VII — Certain defects in the international application
- [ ] Box No. VIII — Certain observations on the international application

2. **FURTHER ACTION**

If a demand for international preliminary examination is made, this opinion will be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1*bis*(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

3. For further details, see notes to Form PCT/ISA/220.

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Box No. I Basis of the opinion

1. With regard to the **language**, this opinion has been established on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.

   ☐ This opinion has been established on the basis of a translation from the original language into the following language , which is the language of a translation furnished for the purposes of international search (under Rules 12.3 and 23.1(b)).

2. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:

   a. type of material

      ☐ a sequence listing

      ☐ table(s) related to the sequence listing

   b. format of material

      ☐ in written format

      ☐ in computer readable form

   c. time of filing/furnishing

      ☐ contained in the international application as filed.

      ☐ filed together with the international application in computer readable form.

      ☐ furnished subsequently to this Authority for the purposes of search.

3. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.

4. Additional comments:

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Box No. V **Reasoned statement under Rule 43*bis*.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

1. Statement

Novelty (N)	Claims	**15-17**	**YES**
	Claims	**1-14, 18-21**	**NO**
Inventive step (IS)	Claims		**YES**
	Claims	**1-21**	**NO**
Industrial applicability (IA)	Claims	**1-21**	**YES**
	Claims		**NO**

2. Citations and explanations:

Citation:

D1: EP 1001520, D2: WO 2001/086796, D3:WO 2002/039570, D4: US5625538, D5: FR 2688359, D6: GB 2261779, D7: US 5298836, D8: US 5696670, D9: JP 2003047242, D10: JP 10257765, D11: JP 08051774

Document D1 discloses switching power supply (Fig.1) for various electronic devices. It has direct current voltage source (Di), coil of known inductance (PIT), switch means (transistor Q1), and a control circuit which varies duty cycle (switching frequency) depending on the level of secondary output voltage. In fact, control circuit acts as a rudimentary analogue computer which establishes fixed mathematical relationship between the output voltage and the switching frequency. Power supply further includes capacitors Ci and C2 and diodes (D01 and D04) to rectify the output, so that it acts as DC-DC converter. It can be operated in a flyback and a forward mode (paragraph [0075]).

Document D2 (by the same applicant as that of D1) discloses a modification of the circuit of D1.

Each of the remaining documents D3-D11 disclose a switch-mode power supply or a converter suitable for use with lighting systems which have a DC power source, an inductor or a transformer, a switching means (a transistor, MOSFET, etc) and control means (such as PWM controller or similar) to vary the switching frequency/mark-space ratio/duty cycle so to control, adjust or keep constant the output voltage. Control means establishes definite mathematical relationship between the output signal and the switching frequency of the input. Some of the documents (D3-D5, D9- D11) additionally include rectification means on the output, so that the whole circuit acts as an adjustable DC-DC converter.

None of the documents disclose microprocessor being part of the control means.

CLAIMS 1-14, 18- 21 - NOVELTY AND INVENTIVE STEP

In accordance with above observations claims 1-14 and 18-21 are not novel comparing to D1-D4 and D9-D11. Accordingly claims 1-14 and 18-21 lack an inventive step comparing to any of D1-D4 and D9-D11.

At least some of the claims 1-14 and 18-21 are also not novel comparing to D5-D8, while remaining lack an inventive step because they add only a generic features that are will-known in the art of power electronics (such as "diode", "buck converter", "boost converter", "flyback converter", etc)

CLAIMS 15-17 – NOVELTY AND INVENTIVE STEP

Claims 15-17 are novel. However they lack an inventive step comparing to any of the documents D1-D11 because they add only generic features ("microprocessor", "stored instructions", etc.) which are well-known in the art of power electronics. Controlling switch-mode power supplies by a microprocessor, which always have some kind of stored instructions, is very common today.

CLAIMS 1-21 – INDUSTRIAL APPLICABILITY

Invention defined in all claims 1-21 is industrially applicable

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Box No. VIII Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

At least claims 1 and 19 are not clear because the working relationship between the defined integers is not apparent. Claims 1 and 19 define that "input power is substantially constant" or "held effectively constant". Does the feature of "input power" refer to the input terminals of the load (lamp, transducer) in which case it is really an "output of the power supply" or it refers to the input of the whole circuit, in which case it refers to the "output of the DC supply"?